Isolation and Identification of Heavy Metals and Antibiotics Resistant Bacillus SPP

Masoume Kiafar*; Khosro Issazadeh; Ali Vahidi Asl; Soheil Shokri

Division of Microbiology, Department of Molecular and Cell Biology, Lahijan Branch, Islamic Azad University Lahijan, Iran

kiafar_m@yahoo.com

Background & Objectives: Antibiotics and heavy metals are antimicrobials that Bacillus spp. has developed resistance against them. According to the importance of Bacilli to production of enzymes, secondary metabolites and metals reduction, isolation and identification of Bacilli resistant to heavy metals including Cu, Cd, Cr, Zn, Pb and Hg from Coastal sediments in Caspian have been addressed in present study.

Methods: After confirmation of isolated Bacillus species by biochemical tests To prove the correct identification of species, species, *B. licheniformis* were identified by PCR and was confirmed Sequencing . Agar dilution and microdilation techniques were used to determination of MIC. To determination of MBC, microdilution methods was utilized.

Results: In addition, level of heavy metals in different areas coastal sediments was measured by atomic absorption spectrophotometery and it was found that concentration of metals including Hg, Cd and Pb were very low in coastal sediments. Out of 75 collected samples, 50 spore forming Bacillus were isolated among them and 18 isolates were resistant to heavy metals. Results indicated that there is no significance relationship between temperature, pH, salinity and isolation of all kinds of resistant spore forming Bacillus. (According to the fact that calculated sig rate was larger than assumed probability sig < 0.05). Isolated Bacilli were including *Bacillus cereus, B. subtilis, B. brevis, B. circulans, B. marinus, B. megaterium, B. thuringiensis, B. mycoides, B. firmus, B. pycnus, B. atrophaeus, B. sphaericus, B. insolitus, B. licheniformis, B. schlegelii, B. lentus, B. pumilus and B. badius.*

Conclusion: Results indicated that all isolated species exhibited high resistant to Lead, Chrome and Zinc. Existence of heavy metals resistant Bacillus species in Caspian sea use them as well suited agents for bioremidation.

Keywords: Bacillus; Antibiotics; Heavy Metalas